

# Annexes

## Annex I List of contributing authors and organisations

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# Annex II

## Detailed scoring tables

### I: Freshwater shortage

Environmental issues	Score	Weight	Environmental concern	Weight averaged score
1. Modification of stream flow	2	20	Freshwater shortage	2
2. Pollution of existing supplies	2	50		
3. Changes in the water table	2	30		

Criteria for Economics impacts	Raw score	Score	Weight %
Size of economic or public sectors affected	Very small  Very large	2	35
Degree of impact (cost, output changes etc.)	Minimum  Severe	3	55
Frequency/Duration	Occasion/Short  Continuous	2	10
<b>Weight average score for Economic impacts</b>		<b>2.55</b>	
Criteria for Health impacts	Raw score	Score	Weight %
Number of people affected	Very small  Very large	2	50
Degree of severity	Minimum  Severe	2	40
Frequency/Duration	Occasion/Short  Continuous	2	10
<b>Weight average score for Health impacts</b>		<b>2.0</b>	
Criteria for Other social and community impacts	Raw score	Score	Weight %
Number and/or size of community affected	Very small  Very large	2	30
Degree of severity	Minimum  Severe	2	50
Frequency/Duration	Occasion/Short  Continuous	2	20
<b>Weight average score for Other social and community impacts</b>		<b>2.0</b>	

### II: Pollution

Environmental issues	Score	Weight	Environmental concern	Weight averaged score
4. Microbiological	2	35	Pollution	1.85
5. Eutrophication	1	10		
6. Chemical	2	25		
7. Suspended solids	1	5		
8. Solid wastes	2	15		
9. Thermal	0	0		
10. Radionuclides	0	0		
11. Spills	2	10		

Criteria for Economics impacts	Raw score	Score	Weight %
Size of economic or public sectors affected	Very small  Very large	2	30
Degree of impact (cost, output changes etc.)	Minimum  Severe	2	50
Frequency/Duration	Occasion/Short  Continuous	2	20
<b>Weight average score for Economic impacts</b>		<b>2.0</b>	
Criteria for Health impacts	Raw score	Score	Weight %
Number of people affected	Very small  Very large	2	50
Degree of severity	Minimum  Severe	2	40
Frequency/Duration	Occasion/Short  Continuous	2	10
<b>Weight average score for Health impacts</b>		<b>2.0</b>	
Criteria for Other social and community impacts	Raw score	Score	Weight %
Number and/or size of community affected	Very small  Very large	2	45
Degree of severity	Minimum  Severe	2	35
Frequency/Duration	Occasion/Short  Continuous	2	20
<b>Weight average score for Other social and community impacts</b>		<b>2.0</b>	

### III: Habitat and community modification

Environmental issues	Score	Weight	Environmental concern	Weight averaged score
12. Loss of ecosystems	2	40	Habitat and community modification	2
13. Modification of ecosystems or ecotones, including community structure and/or species composition	2	60		

Criteria for Economics impacts	Raw score	Score	Weight %
Size of economic or public sectors affected	Very small  Very large	2	30
Degree of impact (cost, output changes etc.)	Minimum  Severe	2	40
Frequency/Duration	Occasion/Short  Continuous	2	30
<b>Weight average score for Economic impacts</b>		<b>2.0</b>	
Criteria for Health impacts	Raw score	Score	Weight %
Number of people affected	Very small  Very large	0	
Degree of severity	Minimum  Severe	0	
Frequency/Duration	Occasion/Short  Continuous	0	
<b>Weight average score for Health impacts</b>		<b>0</b>	
Criteria for Other social and community impacts	Raw score	Score	Weight %
Number and/or size of community affected	Very small  Very large	2	40
Degree of severity	Minimum  Severe	2	40
Frequency/Duration	Occasion/Short  Continuous	2	20
<b>Weight average score for Other social and community impacts</b>		<b>2.0</b>	

### IV: Unsustainable exploitation of fish and other living resources

Environmental issues	Score	Weight %	Environmental concern	Weight averaged score
14. Overexploitation	3	40	Unsustainable exploitation of fish	2.25
15. Excessive by-catch and discards	2	30		
16. Destructive fishing practices	2	20		
17. Decreased viability of stock through pollution and disease	0	5		
18. Impact on biological and genetic diversity	1	5		

Criteria for Economics impacts	Raw score	Score	Weight %
Size of economic or public sectors affected	Very small  Very large	2	25
Degree of impact (cost, output changes etc.)	Minimum  Severe	2	50
Frequency/Duration	Occasion/Short  Continuous	2	25
<b>Weight average score for Economic impacts</b>		<b>2.0</b>	
Criteria for Health impacts	Raw score	Score	Weight %
Number of people affected	Very small  Very large	0	
Degree of severity	Minimum  Severe	0	
Frequency/Duration	Occasion/Short  Continuous	0	
<b>Weight average score for Health impacts</b>		<b>0</b>	
Criteria for Other social and community impacts	Raw score	Score	Weight %
Number and/or size of community affected	Very small  Very large	2	35
Degree of severity	Minimum  Severe	2	40
Frequency/Duration	Occasion/Short  Continuous	2	25
<b>Weight average score for Other social and community impacts</b>		<b>2.0</b>	

## V: Global change

Environmental issues	Score	Weight	Environmental concern	Weight averaged score
19. Changes in the hydrological cycle	2	57	Global change	1.57
20. Sea level change	1	43		
21. Increased UV-B radiation as a result of ozone depletion	0	0		
22. Changes in ocean CO <sub>2</sub> source/sink function	0	0		

Criteria for Economics impacts	Raw score	Score	Weight %
Size of economic or public sectors affected	Very small  Very large 0 1 2 3	3	40
Degree of impact (cost, output changes etc.)	Minimum  Severe 0 1 2 3	2	40
Frequency/Duration	Occasion/Short  Continuous 0 1 2 3	2	20
<b>Weight average score for Economic impacts</b>		<b>2.4</b>	
Criteria for Health impacts	Raw score	Score	Weight %
Number of people affected	Very small  Very large 0 1 2 3	2	40
Degree of severity	Minimum  Severe 0 1 2 3	2	40
Frequency/Duration	Occasion/Short  Continuous 0 1 2 3	1	20
<b>Weight average score for Health impacts</b>		<b>1.8</b>	
Criteria for Other social and community impacts	Raw score	Score	Weight %
Number and/or size of community affected	Very small  Very large 0 1 2 3	0	40
Degree of severity	Minimum  Severe 0 1 2 3	0	40
Frequency/Duration	Occasion/Short  Continuous 0 1 2 3	0	20
<b>Weight average score for Other social and community impacts</b>		<b>0</b>	

## Annex III

# Regional agreements, conventions and projects

### **Central American Ecological Summit on Sustainable Development (Cumbre Ecológica Centroamericana para el Desarrollo Sostenible), Managua, Nicaragua, 13<sup>th</sup> October, 1994.**

The Presidents of the Republics of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama, and the Representative of the First Ministry of Belize, met at the Central American Ecological Summit on Sustainable Development. They made the following commitments, among others:

#### **Water**

To prioritise policies and legislation regarding the management and conservation of hydrological resources, including, among others, the strengthening of the legal and institutional framework, and coordination mechanisms between the authorities in charge of the management and administration of water resources either for human consumption, irrigation or electricity generation. Commitments were made for respective authorities to update studies about Central American basins in order to prepare specific projects for their sustainable use and management.

#### **Pollution control**

A two year period was allowed for the countries of the region to implement mechanisms for the monitoring and control of pollution. The Central American Commission of Environment and Development is responsible for the gradual implementation of the commitments, the establishment of decentralisation mechanisms for surveillance and control, and the promotion of public participation in these processes.

### **A Dialogue about Water, Food and Environmental Sustainability, San Jose, Costa Rica, 1<sup>st</sup> November, 2001.**

Conclusions and commitments:

1. Foment integrated water resources management and take into consideration the social, economic and environmental values in order to improve the quality of life.
2. Adopt integrated water resources management, with the river basins being the planning unit.
3. Promote opportunities for dialogue and participation of communities and private, governmental, agricultural and environmental sectors.
4. Formulate guidelines and policies that will assist in the sustainable

use and management of water resources.

5. Develop case studies for implementing the Local Dialogues and activities that involve the sustainable use of water.
6. Develop methodologies to assess the economic value of water resources.
7. Produce a Historical Record of the Meeting and distribute internally within each country.
8. Based on the criteria for determining the locations, each country should provide technical support for the proposed locations.
9. Interact as a Virtual Network by means of an electronic forum for discussion.
10. Compile experiences and good practices in the region in order to exchange information.
11. Design a proposal to be presented in Bonn, which should be regional in nature in order to create a larger impact, although this does not eliminate the possibility of generating pilot projects at the micro-basin level.
12. A regional commission was formed to follow up the commitments of "A Dialogue about Water, Food and Environmental Sustainability."

### **Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the North-East Pacific (Antigua Convention), Antigua, Guatemala, 18<sup>th</sup> February 2002.**

The aim of this Convention is to establish a regional co-operation framework to encourage and facilitate the sustainable development of marine and coastal resources of the countries of the North-East Pacific for the benefit of present and future generations. The contracting parties recognised the need to protect and preserve the marine and coastal environment of the North East Pacific against all kinds of environmental pollution and degradation. The ecological, economic, social and cultural value of the area was seen as a means of bonding the countries of the region. The scope of application of the Convention comprises the maritime areas of the North East Pacific, defined in conformity with the United Nations Convention on the Law of the Sea. The Secretariat of the Convention is the Central American Commission for Maritime Transportation (COCATRAM) located in Managua, Nicaragua.

Marine Corridor for the Conservation and Sustainable Development of the South East Tropical Pacific

This corridor was established on 2<sup>nd</sup> April 2004 and embraces the islands Galapagos (Ecuador), Gorgona and Malpelo (Colombia), Coiba (Panama) and Cocos (Costa Rica). The initiative reinforces cooperation between these countries in order to protect biological diversity.

#### **Large Marine Ecosystems (LMEs) of the world**

Several institutions are providing and fostering scientific and technical support for developing countries to establish new policies and actions

in order to eliminate the causes of marine environmental degradation, as well as the loss of biodiversity and food security due to over-exploitation. For the Central American Pacific coast, the LME stretches from Cape Corrientes in Mexico in the north to Ecuador in the south, including the basins of Guatemala and Panama and the Peru-Chile trench. The system is located between the California and Humboldt currents.

## **Conventions, protocols and projects relevant to the colombian pacific sub-system**

#### **Convention for the Protection of the Marine Environment and Coastal Areas in the South East Pacific (1981)**

This Convention, also known as the Lima Convention, was signed on 12<sup>th</sup> November, 1981 by Chile, Colombia, Ecuador, Peru and Panama. It was initiated by the United Nations Environment Programme (UNEP). The main objective of the Convention is to promote regional cooperation in the protection of the marine environment and coastal zones of the South East Pacific, emphasizing the economic, social and cultural significance of the South Pacific.

#### **Plan of Action for the Protection of the Marine Environment and Coastal Areas of the South Pacific (1981)**

This Plan has the same characteristics as other UNEP Regional Seas Programmes. The main objective of this regional cooperation mechanism is to protect the marine environment and coastal areas in order to safeguard the health and well being of current and future generations. The general legal framework of the Plan of Action of the South East Pacific is the Convention for the Protection of the Marine Environment and Coastal Areas of the South East Pacific. The Plan of Action for the South East Pacific has the following components:

- Environmental assessment: This provides the scientific basis to implement the other components of the Plan. It comprises an assessment of the pollution caused by oil spills; the degree of pollution caused by industrial, mining and agricultural wastes and their effects; and pollution caused by domestic wastes, radioactive pollution, and from the atmosphere, among others.
- Environmental management: Formulation and application of programmes to prevent, monitor, reduce and eliminate pollution.
- Legal component: The development of regional instruments constitutes a major achievement of the Plan of Action.
- Institutional and financial mechanisms: According to this component,

the General Authority of the Plan of Action remains with the regular meeting of Government representatives (Intergovernmental Meetings). They are mandated to assess the implementation progress of the Plan of Action and approve the projects and activities.

#### **Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South East Pacific (1989)**

This Protocol contains regulations regarding protected areas such as common criteria to establish protected areas and the regulation of activities through an integrated environmental management mechanism. Guidelines include, among others, buffer areas; measures to prevent, reduce and control pollution in protected areas; environmental impact assessments; establishing an integrated analysis procedure; scientific and technical cooperation; and promotion of stakeholder participation and environmental education. This protocol was approved by Colombia through Law 12 (1992).

#### **Protocol on the Program for the Regional Study of the “El Niño” Phenomenon in the South East Pacific (ERFEN) (1992)**

The member States of the Permanent Commission for the South Pacific (CPPS; Chile, Colombia, Ecuador and Peru) signed this protocol on 6<sup>th</sup> November 1992 in Callao, Peru. The aim of ERFEN is to forecast ocean-atmospheric changes with sufficient warning time to allow the issue of policies and emergency measures to limit the impact on productive activities such as fishing, agriculture and industry, among others.

#### **Framework Agreement for the Conservation of Living Resources on the High Seas of the Southeast Pacific (Galapagos Agreement 2000)**

The member States of CPPS signed this agreement in 2000. The main objective of this Agreement is to define the legal framework for the

conservation and management of living marine resources in the high seas of the South East Pacific, with special reference to straddling and highly migratory fish populations. The Agreement is applicable to the high seas beyond the external limits of the EEZ of the countries located on the 120° W meridian between 5° N and 60° S.

### **Pacific Agenda 21**

Pacific Agenda 21 has adopted a cultural approach to changing the traditional model of communication between governments and Pacific communities. It attempts to deal with social problems involving various stakeholders and to find solutions to problems that threaten the environmental and cultural diversity of the Colombian Pacific region. The objective of Pacific Agenda 21 is to provide a local perspective, through the participation of stakeholders, to long-term policies, plans and programmes for the development of this area, taking into account the ethnic, cultural, social and economic realities of the Colombian Pacific (IIAP 2001a).

### **Project Biopacifico**

This project, implemented by INDERENA and the National Department of Planning, focuses on the Choco biogeographic region. The general

objective of the project is to contribute towards the consolidation of a new development strategy, based on scientific knowledge, and to identify options for the management of biodiversity in order to guarantee its protection and sustainable use by local communities. The goals of the project include, among others: i) assessment of the state of the region's biodiversity and the current practices affecting its use and conservation; ii) assessment of the dynamics and effects of agro-ecological systems; iii) development of conceptual and methodological approaches for the valuation of biodiversity and environmental services; iv) strengthening of communication, education and social organisation processes related to the conservation and exploitation of biodiversity; v) training of authorities about policies, planning and decentralized management of biodiversity; vi) training of local people who are involved in conservation and the sustainable use of biodiversity; and vii) institutional coordination with other regional and national plans, programmes and projects (INDERENA 1992).

# Annex IV

## Fee-and-rebate system (Southwest Mexico sub-system)

### Adjustable implementation features of fees and rebates

A fee-and-rebate system for municipal waste can be adapted for specific requirements. There are opportunities to decide on the number and features of municipalities in the programme, the threshold or target level of pollution, and the size of the rebates and fees. In addition, innovative programmes have started to integrate fee and rebate systems with tradable pollution permits.

### Which cities to include

A fee-and-rebate system does not have to include every municipality. Given that most municipal waste stems from urban areas and that wide gaps in financial resources exist between urban and rural zones, it is more practical to focus a fee-and-rebate system on larger cities. The population threshold can be set by SEMARNAT. Mexico already has different water infrastructure policies for rural and urban areas. The same distinctions can be retained in the implementation of a fee-and-rebate system.

### Setting pollution thresholds

Threshold limits for pollution – where rebates switch to fees – have to be set. The thresholds can be based on the prior history of pollution; the population of the city; or environmental health indicators.

Basing threshold levels on prior history requires every city, regardless of their past history of pollution, to make additional effort to meet the threshold. This method favours cities which have not introduced any pollution abatement methods. These municipalities will usually be able to take advantage of more lower-cost technologies than cities that were reducing water pollution before the implementation of fees and rebates.

Basing allowable pollution levels on a municipality's population provides room for adjustment, and rewards cities who have already made an effort to reduce and/or treat water pollution. Allowing time for municipalities to update their wastewater infrastructure capacity prior to implementation increases the political viability of the fee and rebate structure.

Basing threshold levels on environmental health standards places the main focus on safeguarding the local environment (as opposed to aggregate watershed pollution). Standards have frequently been set in the form of Total Maximum Daily Loads – maximum pollution levels on waterways where the wastewater is discharged. This method places a heavier burden on large cities and does little to reduce the pollution per capita in smaller cities and cities that discharge wastewater into larger waterways. The population of the city and the size of the receiving water body affect the overall pollution levels in waterways. Large cities can reduce wastewater pollution per capita, but have few options to reduce the overall city population.

### Setting fees and rebates

When it comes to municipal water pollution, the commitment to a fee-and-rebate system has to be credible and long-term. Cities will make decisions about whether or not to invest in wastewater treatment infrastructure based on expected future returns. Year-to-year uncertainty about the size of the rebates and fees complicates local decisions about investment in water pollution infrastructure, and may deter investment. Nonetheless, this does not mean fees and rebates must remain fixed. It does, however, require advanced warning regarding upcoming changes to the structure of the fee and rebate system.

A five year timetable of fee-and-rebate changes is recommended so that municipalities can calculate the costs and benefits of their investments in wastewater infrastructure. Although the fee changes require some advance notice, the penalties and rebates themselves do not have to be fixed in a given year. Penalties and rebates can be graded. SEMARNAT can charge smaller fees per-pollution-unit to municipalities that exceed the threshold by only a little and larger fees per-pollution-unit for those that significantly exceed threshold levels.